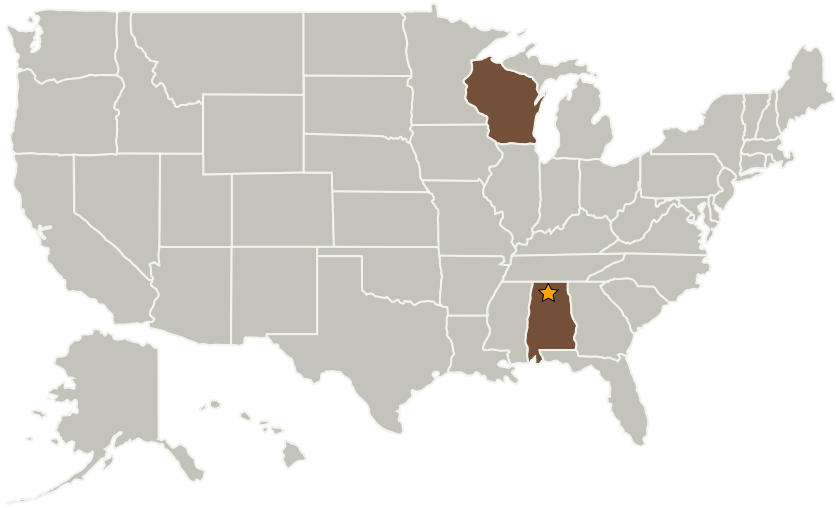
Plasma Air Decontamination System (PADS), Phase II

Completed Technology Project (2007 - 2009)

Project Introduction

The proposed Plasma Air Decontamination System (PADS) is a trace contaminant control device based on non-thermal atmospheric-pressure plasma technology. Compared to the Trace Contaminant Control System (TCCS) and the Vapor Phase Catalytic Ammonia Removal system (VPCAR), this novel technology operates at ambient temperature and atmospheric pressure, requires less energy, has no moving parts, and requires no consumables. The non-thermal plasma has been proven successful in decomposing various volatile organic carbons (VOCs) found in spacecraft environments. The prototype PADS reactor developed in Phase I has also demonstrated successful removal of ammonia and selected VOCs (e.g., methane, acetone, methylene chloride, and ethylbenzene) in air. The Phase II effort will further optimize this technology and improve its efficiency. It will be designed to interface with both TCCS and VPCAR. Its incorporation would eliminate the high-temperature catalytic reactors in the two systems, and facilitate a decrease in size or total elimination of the intensive resupply of activated carbon for adsorbent beds. This would result in significant savings in launch mass and cost for long duration missions and a reduction in power requirements. It also has great potential to be scaled to various applications and/or incorporated into other life support systems for streamlined air purification.

Primary U.S. Work Locations and Key Partners



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Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Center / Facility:

Marshall Space Flight Center (MSFC)

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

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Organizations Performing Work	Role	Type	Location
★Marshall Space Flight Center(MSFC)	Lead Organization	NASA Center	Huntsville, Alabama
Orbital Technologies Corporation	Supporting Organization	Industry Women-Owned Small Business (WOSB)	Madison, Wisconsin

Primary U.S. Work Locations	
Alabama	Wisconsin

Project Transitions

November 2007: Project Start

November 2009: Closed out

Project Management

Program Director:

Jason L Kessler

Program Manager:

Carlos Torrez

Technology Areas

Primary:

- TX06 Human Health, Life Support, and Habitation Systems
  - TX06.1 Environmental Control & Life Support Systems (ECLSS) and Habitation Systems
    - TX06.1.1 Atmosphere Revitalization